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CONTRIBUTIONS TO THE FLORA OF NOVA SCOTIA:

V. RESULTS OF EXPLORATION IN
CUMBERLAND COUNTY

W. B. SCHOFIELD

CAPE BLOMIDON, Kings County, has long been known as a botanically rich area containing a number of interesting montane species. *Saxifraga Aizoon* Jacq. (var. *neogaea* Butters) was reported from the area many years ago (Lawson, 1884), but no substantiating specimen seems to have survived.¹ A. E. Roland (1938, 1947) reported *Draba arabisans* Michx. and *Arabis Drummondii* Gray which are locally quite abundant on an exposed boulder slope. Recently J. S. Erskine (Smith & Erskine, 1954) has collected *Lycopodium Selago* L., *Poa glaucantha* Gaudin, and *Trisetum spicatum* (L.) Richter, var. *pilosiglume* Fernald from Amethyst Cove, a short distance from the Cape; these are local on the cooler cliff shelves.

A relationship of the flora of Cape Blomidon to that of northern Cape Breton Island has been implied on the basis of rather inadequate botanical evidence, but much evidence is accumulating as the floras of both areas become better known. The relation of Blomidon's flora to that of Cumberland County has been practically unknown, but the few collections from that county had suggested a positive relationship (Smith & Erskine, 1954).

Intensive botanical exploration in the northern portion of Cape Breton Island has stimulated interest in the montane

¹ A recent re-collection of this species from Cape Blomidon indicates that it is still present there: scattered plants on dry soil, shelves and pockets of lower portion of cliff, about 2 miles south of Cape Split, Cape Blomidon, Kings County, W. B. Schofield and D. H. Webster 5873.

element of Nova Scotia's flora. It was one of the aims of the writer to accumulate evidence from Cumberland County either supporting or refuting the implied relationships of its flora to more northerly areas. This exploration, carried on during the summers of 1953 and 1954, was done under the sponsorship of the Nova Scotia Research Foundation. The results have been most gratifying.

Unquestionably the most interesting association of montane species known in peninsular Nova Scotia is to be found in the vicinity of Cape d'Or, Cumberland County. The montane aspect of the west-facing cliff-top is quite remarkable. There the strong winds have so blasted the area behind the precipice that a narrow treeless border has been left wherein one finds the following association of species: *Saxifraga Aizoön* Jacq., var. *neogaea* Butters; *Astragalus Robbinsii* (Oakes) Gray; *Oxytropis johannensis* Fern.; *Chrysanthemum Leucanthemum* L., var. *pinnatifidum* LeCoq & LaMotte; *Festuca rubra* L.; *Sedum Rosea* (L.) Scop.; *Plantago juncoides* Lam, var. *decipiens* (Barnéoud) Fern.; *Poa pratensis* L. (*sensu lato*); *Poa compressa* L.; *Oenothera biennis* L.; *Cardamine parviflora* L., var. *arenicola* (Britt.) Schulz; *Antennaria canadensis* Greene; *Campanula rotundifolia* L.; *Trisetum spicatum* (L.) Richter, var. *pilosiglume* Fern.; *Cirsium arvense* (L.) Scop.; *Draba arabisans* Michx.; *Achillea lanulosa* Nutt.; *Solidago bicolor* L., and *Agropyron trachycaulum* (Link) Malte, var. *novae-angliae* (Scribn.) Fern.

As can be noted by the list, highly competitive weedy species are producing a marked change in the vegetation of the cliff-top. Doubtless the rare species will continue to persist in the more exposed areas where they tend to flourish.

Behind this narrow band is the tangled barrier of alder, which forms another distinct border to the cliff-margin vegetation. In areas among these alders are found small open patches of *Potentilla fruticosa* L., and *Heracleum maximum* Bartr.

Other areas that harbor interesting species include a high cliff at New Prospect, near Parrsboro, where *Draba arabisans* Michx.; *Carex rosea* Schkuhr; *C. convoluta* Mackenz.; *Muhlenbergia mexicana* (L.) Trin.; *Milium effusum* L.; and *Festuca obtusa* Biehler, are found in abundance (although not montane, these species are extremely local in the province). At Advocate,

above the salt marsh, on the eastern bank of Burke Brook, *Montia lamprosperma* Cham. abounds near a cold springy area and *Stellaria humifusa* Rottb., carpets large patches of the marsh near the brook.

The cliffs of Isle Haute, the largest of Nova Scotia's Bay of Fundy islands, also hold several interesting species, among which are *Draba arabisans* Michx.; *Arabis Drummondii* Gray; *Poa glaucantha* Gaudin and *Lycopodium Selago* L. (the final species being exceedingly rare).

The deeper brook valleys yielded rather sparse collections of montane species. McAlese Brook, New Prospect, was by far the richest, possessing on the moist slope near its waterfall *Carex atratiformis* Britt., and on the cliff above *Lycopodium Selago* L., and *Dryopteris fragrans* (L.) Schott., var. *remotiuscula* Komarov.

The flora of Cumberland County cannot be considered completely known on the basis of these two summers' collections, but these certainly point out the importance of intensive exploration in one area. In the following list are four species new to the province and numerous records of very local species.

All collections mentioned are from Cumberland County unless noted otherwise; all numbers given without the name of a collector are those of the writer. Specimens have been deposited at the Acadia University Herbarium.

Special acknowledgement is due the sponsoring institution: Nova Scotia Research Foundation, without whose support much of this exploration could not have been done. The writer is also most grateful for the considerable aid and helpful advice received from Dr. E. C. Smith of Acadia University and J. S. Erskine of Wolfville, Nova Scotia.

Lycopodium Selago L. Cliff-top, south side, Isle Haute (J. S. Erskine & W. B. Schofield, JSE 53.038); locally abundant in rock crevices of river bank, West Moose River (3170); local colony on moist cliff facing McAlese Brook, New Prospect (3234). The species, widely distributed, but local, in northern Cape Breton Island, is very rare in peninsular Nova Scotia.

Sparganium minimum Fries. Very abundant in marginal water of Wigmore Lake (4245). Known from a few local stations in the province; the above colony covered an area of about fifteen square yards.

Potamogeton spp. Several interesting species of this genus were collected and are to be treated later by D. H. Webster in a paper devoted to the genus.

Najas flexilis (Willd.) Rostk. & Schmidt. This species is now known to be fairly widespread (cf. Smith & Schofield, 1952). The following collections

from Cumberland County mark its wide distribution there: rare in marginal shallows of Leak Lake (3557); marginal shallows of Lake Killarney (4165); on sand of shallow water, Newville Lake (3606); in wrack of Mattatall Lake (3996); small riverside pond, Head of River Hebert (W. B. Schofield & D. H. Webster 5632).

Sagittaria graminea Michx. Common on gravelly shore of Newville Lake (3562); wet margin of Dewar's Lake (4073); rare in mud of lake margin, Lake Killarney (4156); margins of Big Lake, Victoria (5394). The above collections do not support the suggestion of Roland (1947), "apparently local and rare in the northern and central parts of the peninsula." Although it often does not flower, the stiffly arching, thick, underwater leaves readily distinguish it from any other known Nova Scotian species of *Sagittaria*.

Festuca obtusa Biehler. Abundant on hardwood slope, New Prospect (3453); very abundant on rich hardwood slope about one mile east of Refugee Cove (5191). A collection from Kings County is also of interest: occasional among small trees at base of high cliff, Cape Blomidon (Schofield & Webster 5230). Previously known only from Five Mile River, Hants County (Fernald, 1921).

Poa alsodes A. Gray. Damp margin of McGahey Brook (W. B. Schofield & P. A. Bentley 4795). This very slender species of *Poa* is readily distinguished in the field from any other Nova Scotian species, for the very capillary rachillas and culms, that often tumble over, are quite different from the far coarser aspect of most species. Known from a few locations in N. S.; in the above location it grew abundantly on the damp shaded flood plain of the brook.

P. glaucantha Gaudin. The following collections are all from Isle Haute: occasional in cliff crevices, usually damp, near Pigeon Point, North Side (3760); rock crevices, North Side, Boar's Head (3835); abundant on upper slopes and crevices, central North Side (3838); rare in cliff crevices, Wrack Cove (3886); rock crevices, Western Slope (3904). Previously known from a number of stations in northern Cape Breton (Smith & Schofield, 1952) and from Cape Blomidon, Kings County (Smith & Erskine, 1954).

Schizachne purpurascens (Torr.) Swallen. Very rare in rock crevices, West Moose River (3160). Hitherto, in peninsular Nova Scotia, this species was known from only Moore's Falls, near Kentville, Kings County. Two further collections mark its presence on North Mountain, Kings County: rare in spruce woods, Cape Split (3310A); occasional clumps on grassy slopes above boulder scree, Cape Blomidon (Schofield & Webster 4550). The species is locally abundant in northern Cape Breton Island.

Sphenopholis intermedia Rydb. Damp cliff gully, Moose Island, Colchester County (5041); seepy, mucky slope near Indian Springs Brook, Cape Blomidon, Kings County (Schofield & Webster 5233). Dore and Roland (1942) remarked that this grass was found "where its roots were in contact with limestone or gypsum." The basalt of the above stations (plus inclusions of gypsum found in the sandstone) would probably produce a similar basic soil. Very local in Nova Scotia and previously unknown from the north-central counties.

Trisetum spicatum (L.) Richter, var. *pilosiglume* Fern. Frequent on exposed cliff headlands, Cape d'Or (Schofield & Bentley 4798). Locally abundant in northern Cape Breton Island and known in peninsular Nova Scotia from the Cape Blomidon area.

Muhlenbergia mexicana (L.) Trin. Common at moist base of cliff and in

crevices, New Prospect (3449); banks of Wallace River, Wentworth (5248). Known previously from Kings, Hants, and Halifax Counties (Smith & Erskine, 1954). The station in Wentworth is most interesting, in that it is the first to be discovered on a river not emptying into the Minas Basin.

Milium effusum L. Occasional under hardwoods of slope at base of cliff, New Prospect (3142); damp woodland margin of McGahey Brook (Schofield & Bentley 4785). A species fairly frequent in the rich hardwood stands of northern Cape Breton Island, it was previously known from the mainland of the province from Cape Blomidon, Kings County, and Five Mile River, Hants County. In the hardwood forests of Cape Chignecto the species flourishes.

Eleocharis nitida Fernald. Rare on road to Cape d'Or (Schofield & Bentley 4817). Other collections of this rare species: occasional in moist soil over basalt, Elliott Lake, Annapolis County (W. B. Schofield & J. S. Erskine 3113); frequent on woods road, Cape Split, Kings County (3308, 3319); damp woodland roadside, Economy Mountain, Five Islands, Colchester County (4949); damp pockets in burned-over area, north east end, Scatari Island, Cape Breton County (E. C. Smith, W. B. Schofield, D. H. Webster, L. Slipp & J. Taylor 8596). The above collections were all found in association with soils derived from volcanic rock; this agrees with Fernald's remark about this species (Fernald, 1922).

E. ovata (Roth) R. & S. var. *ovata*. In small tufts, margin of pond, Truemanville (4200). This is a re-collection of the typical variety where Fernald (1950A) collected var. *Heuseri* Uechtritz and, apparently, the species, for he reports both from N. S. in the 8th edition of Gray's Manual (Fernald, 1950B). A collection of J. S. Erskine from Sandy Cove, Digby County (Erskine 52.1268) is also the species. On the margin of a dried-up pond behind the barrier beach at Black Point, Halifax County, the species abounds (E. C. Smith, W. B. Schofield, D. H. Webster & P. A. Bentley 12644).

E. ovata var. *Heuseri* Uechtritz. This is very abundant at Truemanville, being far more abundant than the species (4200a). A collection from the shore of Earltown Lakes (E. C. Smith, D. H. Webster & P. A. Bentley 11749) is also this variety. Previously known from Truemanville (Fernald 1950A). It is interesting to note that both of these taxa are found on soils derived from basic rock. Even the collections from Black Point are found on a small local area of Carboniferous limestone.

Scirpus cespitosus L., var. *callosus* Bigel. A single clump in rock crevice, Moose River (3251). This species, although exceedingly common on the Atlantic slope of Nova Scotia, seems to be very rare and local in the north-central counties.

S. hudsonianus (Michx.) Fern. Abundant in wet cliff crevices, West Moose River (3174). This species is also rare in the north-central counties, being represented by only one collection (in the vicinity of River Hebert) on Roland's distribution map of the species (Roland, 1947).

Rhynchospora fusca (L.) Ait. Abundant on boggy margin of Leak Lake (3385); common on moist margin of swamp, west end, Dewar's Lake (4045). Commonest in the south-western counties of the province, these mark further collections in the central portion.

Rhynchospora capitellata (Michx.) Vahl. Abundant on the swampy margin of Dewar's Lake (4064). This is also best known from the south-western counties. The above collection marks its extension into the northern part of the province. In common with all collections made outside the south-west-

ern counties, the above material was very much slenderer than that common to those counties.

Cladium mariscoides (Muhl.) Torr. Abundant on margin of Leak Lake (3481); marginal water of Mattatall Lake (4007); common on beach of Dewar's Lake (4041); damp swamp of Big Lake (4249). This species is much commoner in the province than previous records indicate.

Carex rosea Schkuhr. Abundant under hardwoods of slope near base of cliff, New Prospect (3143). Known from a few local stations in the province.

Carex Mackenziei Krecz. Wet quaking areas of salt marsh, Five Islands, Colchester County (4951); mucky area of salt marsh, Advocate, Cumberland County (5103). The distribution of this species is poorly known, but as Roland (1947) remarks, it is "probably general."

Carex pedunculata Muhl. Rich hardwood slope about one mile east of Refugee Cove (5190). Sterile plants of this species were noted on Moose Island, Colchester County, but were not collected. This species was previously reported from only two stations on North Mountain: Cape Blomidon, Kings County and north of Annapolis, Annapolis County. Another collection: from dryish open woods, top of North Mountain, Arlington, Kings County (D. S. Erskine 906). A collection of J. S. Erskine indicates its presence in Hants County: swamp, Oulton's Ridge, near Windsor (J. S. Erskine, June 8, 1947).

C. atratiformis Britt. Local on moist cliff facing waterfall, McAlese Brook, New Prospect (3226). Known only from northern Cape Breton Island, the above collection marks its first report from peninsular Nova Scotia.

C. capillaris L. var. *capillaris*. Tiny plants forming rounded cushions on seepy exposed slope at cliff-top, Cape d'Or (Schofield & Bentley 4804, Schofield 5168). Var. *major* Blytt is known from a number of stations in northern Cape Breton Island. The typical variety is readily distinguished from this by its possession of darker green leaves, shorter stature and in its formation of very dense tussocks rather than single erect clumps. New to Nova Scotia.

C. comosa Boott. Roadside behind dyke, Advocate (5155); abundant clumps in swamp, Truemanville (4192). Reported only from the Annapolis Valley, the above collections indicate its presence in north-central Nova Scotia.

C. Tuckermanii Boott. Local in meadow swale, Wallace River, Wentworth (5352). Known from Sweet's Corner, Hants County (Smith & Erskine, 1954).

Juncus Vaseyi Engelm. Abundant cespitose clumps in cranberry bog, Linden (5400). New to Nova Scotia; this fills in a range gap, for it is known from adjacent New Brunswick.

Luzula parviflora (Ehrh.) Desv., var. *melanocarpa* (Michx.) Buchenau. Wet wooded margin of McGahey Brook (Schofield & Bentley 4783); damp margin of Mill Brook (Schofield & Bentley 4825); rare on banks of Soldier Brook (5202). Reported once from peninsular Nova Scotia (Erskine, 1951), this from Three Sisters, Cumberland County. The above collections show that it is widespread (but never abundant) in the Cape Chignecto area.

Trillium erectum L., forma *albiflorum* R. Hoffm. Occasional among typical plants, alder thicket, North Side, Isle Haute (J. S. Erskine & W. B. Schofield JSE 53.041). This form was previously reported from North Mountain, Annapolis County (Roland, 1947).

Malaxis brachypoda (Gray) Fern. Rare in wet area beside trickle near

Indian Flats, Isle Haute (3773). Previously unknown from the province, the above collection fills in a gap in the range of this species, found locally in the neighbouring provinces and states.

Liparis Loeselii (L.) Richard. Rare in damp area in field near road, Isle Haute (3830); springy area, roadside near Folly Lake (3981); abundant in railroad ditch, Pineo Lake, Conn's Mills (5462). Its presence in the northern part of the province had not previously been suspected.

Geocaulon lividum (Richards.) Fern. Among heaths of bog, Spicer's Cove (Schofield & Bentley 4838). This is the second collection from peninsular Nova Scotia. A collection from among heaths of a moist heath bog, Auburn, Kings County (3097) is very close to the previously known station at Kingston. The species is widespread, but local, in Cape Breton Island.

Polygonum hydropiperoides Michx., var. *hydropiperoides*. In water of River Hebert, near south end of Newville Lake (3559). This species was previously known only from south-western Nova Scotia.

Stellaria humifusa Rottb. Brackish marsh near Cape d'Or (3948); forming mats near upper part of salt marsh, Advocate (5125). Previously reported as mainly from eastern Nova Scotia and Cape Breton Island, the above collections indicate its presence in the north-central portion of the province. A collection from the margin of a salt marsh, Five Islands, Colchester County (4950) indicates its presence in the adjacent county as well.

Montia lamprosperma Cham. Abundant on cold trickle margin, upper salt marsh, east side of Burke Brook, Advocate (3618). This species is known from three other widely separated stations (Brier Island, Digby Co.; Port Hawkesbury, Inverness Co.; and Northwest Arm, Halifax Co.). The above collection falls within the expected range of the species.

Ceratophyllum demersum L. On sludge-bottomed margin of Newville Lake (3607); in water of River Hebert, Newville (Schofield & Webster 5645); in wrack of Pineo Lake, Conn's Mills (5463). Reported from two other stations in the province, both in Kings County.

Draba arabisans Michx. Abundant in crevices of high cliff facing road, New Prospect (3150); cliff crevices, South Side, Isle Haute (J. S. Erskine & W. B. Schofield JSE 53.035, Schofield 3696); rare in cliff crevices and on exposed cliff top, Cape d'Or (Schofield & Bentley 4805); small moist rock outcrop on rich hardwood slope, one mile east of Refugee Cove (5199). Hitherto known very locally from Cape Blomidon, Kings County and from Cape Breton Island. It is relatively common on the cliffs of Isle Haute.

Cardamine parviflora L., var. *arenicola* (Britt.) Schulz. Among rocks near boat-house, East End, Isle Haute (3659); talus on cliff, North Side, Pigeon Point, Isle Haute (3786); seepy area of gully on cliff, Cape d'Or (5182). This taxon is doubtless much commoner than was suspected by the single reported station near Halifax (Roland, 1947). The following collections help to support this suggestion: very rare under damp shade of overhanging boulder, near P. Jack Cove, Brier Island, Digby County (1625); abundant in moist humus pockets of boulder talus, Cape Blomidon, Kings County (3084).

Arabis hirsuta (L.) Scop., var. *pyncocarpa* (M. Hopkins) Rollins. Small moist outcrop on rich hardwood slope about one mile east of Refugee Cove (5200). This species has been reported from Indian Brook, Victoria County (Smith & Erskine 1954). The following collection indicates its presence in Colchester County: talus slope, north-west side, Moose Island (4962). At the latter locality it was fairly abundant.

Arabis Drummondii Gray. Talus slopes near Western Slope, Isle Haute (J. S. Erskine & W. B. Schofield *JSE* 53.036, Schofield 3692); one plant on talus slope, central North Side, Isle Haute (3839). Another species known previously from Cape Breton Island and Cape Blomidon, Kings County.

Sarracenia purpurea L., forma *heterophylla* (Eaton) Fern. Peat bog, Spicer's Cove (Schofield & Bentley 4834). An interesting colour form known from a few local stations (Smith & Schofield, 1952).

Saxifraga aizoon Jacq., var. *neogaea* Butters. Locally abundant on sheltered cliff shelves, Cape d'Or (Schofield & Bentley 4802, Schofield 5164). Previously known from Cape Breton Island and Cape Blomidon, Kings County.

Potentilla fruticosa L. Exposed cliff-top headlands, Cape d'Or (Schofield & Bentley 4811); cliff crevices above sea-stack near Refugee Cove (Schofield & Bentley 4819). Common at both the extreme northern and south-western ends of the province, the above collections note its local abundance in the north-central portion.

Astragalus Robbinsii (Oakes) Gray, var. *Robbinsii*. Depressed clumps on exposed cliff headlands, Cape d'Or (Schofield & Bentley 4800); depressed tussocks on talus above sea stack near Refugee Cove (Schofield & Bentley 4818). The treatment of Barneby in the *New Britton & Brown* has been followed. The above specimens differ only superficially from the description in the above-mentioned manual, and have therefore been included under the typical variety. These collections are of particular interest since they represent the rediscovery of a taxon thought to be extinct from its type area on "dry calcareous ledges, Winooski R., Vt." (Fernald, 1950B). It is relatively common and easily accessible at Cape d'Or. New to Canada.

Oxytropis johannensis Fern. Frequent in cliff crevices and on exposed cliff headlands, Cape d'Or (Schofield & Bentley 4799, Schofield 5183). This species has been known for many years from remote St. Paul Island, Victoria County. The above collection marks its first report from peninsular Nova Scotia.

Geranium Bicknellii (Britt.) Fern. Abundant on talus overgrown with poison ivy, base of cliff, New Prospect (3134). This species has been reported from very few localities.

Impatiens pallida Nutt. Luxuriant on slope, North Side, Isle Haute (3828). A rather uncommon species in the province, the above collection indicates its local occurrence in Cumberland County.

Elatine minima (Nutt.) Fisch. & Meyer. Occasional in shallow water of Leak Lake margin (3396); abundant on mucky margin of Lake Killarney (4180). This species appears to be widely distributed in Nova Scotia, but has been overlooked (cf. Smith & Schofield, 1952).

Myriophyllum tenellum Bigel. Abundant in marginal water of Leak Lake (3482); abundant in marginal water of Newville Lake (3601). Previously unknown from the north-central counties, but now found to be relatively frequent in lakes throughout the province.

Conioselinum chinense (L.) BSP. Seen, but not collected, on the banks of West Moose River; dry headland, Cape d'Or (Schofield & Bentley 4810). A rather rare species in the province, previously unknown from the north-central counties.

Bartonia paniculata (Michx.) Robinson, var. *iodandra* (Robinson) Fern. Damp margin of swamp, west end of Dewar's Lake (4048). The plants were unusually etiolated, possibly due to their submergence during at least

part of their growth period. This collection notes the appearance of this taxon in the north-central portion of the province, where it has been unknown.

Lindernia dubia (L.) Pennell. Damp gravel pit near Shinimecas Bridge (4218) (these tiny plants—up to 3 cm.—were growing among *Ludwigia palustris* and were flowering cleistogamously); damp, muddy bank of River Philip, near Oxford (5371). Known from only two other localities in the province.

Littorella americana Fern. In marginal shallows of Folly Lake (3999). All plants were sterile. This marks its first report from the north-central portion of Nova Scotia and its second collection from the peninsula. It is also of local occurrence in Cape Breton Island (cf. Smith & Schofield, 1952).

Galium boreale L., var. *intermedium* DC. A single colony on hill-top pasture, New Prospect (3262); dry field, Cross Roads (Schofield & Bentley 4700). Known previously from Cape Blomidon, Kings County.

Campanula aparinoides Pursh. Abundant on banks of Parrsboro River (3506); common in moist area near Frog Pond, Isle Haute (3722). This species appears to be more common than was previously suspected (cf. also Smith & Erskine, 1954).

Lobelia spicata Lam. Locally abundant in dry field near shore, Linden (5404). Previously known from Blomidon, Kings County.

Megalodonta Beckii (Torr.) Greene. In wrack of Mattatall Lake (3998). This appears to be the third report of this species from the province.—PERRY BIOLOGICAL LABORATORIES, ACADIA UNIVERSITY, WOLFVILLE, NOVA SCOTIA.

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PLANTS NEW TO MISSOURI

E. J. PALMER AND J. A. STEYERMARK

SINCE the publication in 1935 of the Catalogue of the Flowering Plants of Missouri (Ann. Mo. Bot. Gard. 22: 375-758), work has continued on the further botanical exploration of the state of Missouri and a large number of plants, including several genera not previously known in the state, have been added. The junior author of the Catalogue and of this paper has been particularly active and has made many collecting trips into nearly all parts of the state, resulting in some surprising discoveries. The senior author, since returning to Missouri in 1948, has devoted what time he could to an intensive exploration of several of the southwestern counties, with a few excursions into other sections.

The resulting new discoveries have been reported in Rhodora from time to time in several short papers contributed by the junior author and one by the senior author, as well as in a joint paper on new fern discoveries in the American Fern Journal 42: 61-66. 1952. William B. Drew also reported the discovery of four new records for the state (RHODORA 44: 248. 1942), George B. Van Schaack reported *Calamagrostis insp̄rata* new to the state (RHODORA, 56: 43. 1954), and C. L. Kucera published his findings of *Lyonia ligustrina* in Missouri (RHODORA, 55: 155. 1953). The large number of additional plants now known in the state, as well as many changes in nomenclature and the interpretation of species necessary to bring it into conformity with the eighth edition of Gray's Manual, have made a revision of the Catalogue desirable, and it is hoped that such a revision can be published in the near future. The present paper is a further report of progress and a review of

what has been done up to this time in increasing our knowledge of the state flora.

HYSTRIX PATULA Moench var. *BIGELOVIANA* (Fern.) Deam. This variety has not been reported previously from Missouri. It was found on wooded north-facing ravine slopes tributary to Mill Creek ditch of Missouri River valley, T59N, R38W, sect. 14, 4 mi. south of Oregon, Holt Co., July 20, 1952, *Steyermark* 73829.

LOLIUM MULTIFLORUM Lam. var. *DIMINUTUM* Mutel. Not previously reported from Missouri, this variety was found in open grassy woodland near lake, Lewis and Clark State Park, T55N, R37W, sect. 33 and 28, $\frac{1}{2}$ -1 mi. southwest of Armour, Buchanan Co., August 20, 1950, *Steyermark* 70116.

MUHLENBERGIA MEXICANA (L.) Trin. forma *AMBIGUA* (Torr.) Fern. The record for this form is based upon the following specimen: gravelly open places along South Fork of Spring Creek along highway A, T23N, RSW, south $\frac{1}{2}$ sect. 33, 8 mi. south of West Plains, Howell Co., September 3, 1949, *Steyermark* 69076.

PANICUM CONSANGUINEUM Kunth. This species, primarily of Atlantic and Gulf Coastal Plain distribution from northern Florida to eastern Texas north to southeastern Virginia, Tennessee, and Arkansas, has not been reported previously from Missouri. It is based upon the following collection: wooded oak-hickory sandy knoll, T26N, R14E, sect. 34, $4\frac{1}{2}$ mi. southeast of Sikeston, New Madrid Co., May 18, 1950, *Steyermark* 69667. This station is in the southeastern corner of Missouri, where occur many species the affinities of which align them with the flora of the Mississippi Embayment of the Gulf Coastal Plain.

PASPALUM LAEVE Michx. (typical). The typical form of this species with the spikelets 2-2.5 mm. broad and with the leaf-blades and sheaths glabrous or nearly so has not been reported previously from Missouri. It is now known by the following collections: marshy springy ground at base of slopes of ravines bordering east-facing escarpment on Crowley Ridge, just south of Stephens Cemetery, T24N, R10E, sect. 30, $1\frac{1}{2}$ mi. south of Pyletown, Stoddard Co., August 29, 1948, *Steyermark* 66187; knolls and depressions, T22N, R4E, sect. 35, 4 mi. south of Naylor, Ripley Co., October 20, 1948, *Steyermark* 66943; wet sedgy swales, wet woods, and swampy thickets along highway 25, 3 mi. west of Arbor, Cape Girardeau Co., September 22, 1946, *Steyermark* 64158.

SCIRPUS POLYPHYLLUS Vahl. This addition to the state flora is based upon the following collections: swampy meadow along Bee Fork, on property of Joe Goforth, T32N, R2W, sect. 23, $4\frac{1}{2}$ - $4\frac{3}{4}$ mi. east of Bunker, Reynolds Co., July 7, 1951, *Steyermark* 72041; swampy meadow along Bee Fork, T32N, R2W, sect. 22, on property of Mr. Reese, 4 mi. southeast of Bunker, Reynolds Co., July 7, 1951, *Steyermark* 72002.

CAREX ABDITA Bickn. Whether or not this taxon can be maintained as distinct from *C. umbellata* Schkuhr is questionable. It perhaps should be considered only as a variety of *C. umbellata*. On the basis of the

characters used for separating the two taxa, the following Missouri collection, with perigynia 2.2–2.8 mm. long with short beaks 0.5–0.6 mm. long and acute pistillate scales below becoming more attenuate in the upper ones, may be cited: rocky ground east of highway K, T33N, R33W, sect. 27, 2 mi. northwest of Liberal, Barton Co., April 16, 1949, *Steyermark 67176*.

CAREX BUXBAUMII Wahlenb. forma *DILUTIOR* Kükenth. This form, in which the pistillate scales are whitish or pale brown, has not been reported previously from the state. It was found in a calcareous swampy meadow associated with other species of which the ranges in the United States are northward or northeastward: swampy meadow along West Fork of Black River, on property of D. C. Miner, T33N, R3W, sect. 23 and NE sect. 26, 3–3½ mi. northwest of Greeley, Reynolds Co., July 6, 1951, *Steyermark 71984*.

In this collection some of the terminal spikes are staminate at the base as well as at the summit, while others are staminate only in the upper half. Dr. F. J. Hermann, who has kindly verified the junior author's determination, writes of the collection as follows: "The scales of *Carex Buxbaumii* normally tend to bleach out with age, as they do in many other species found in exposed habitats, so that typical *Buxbaumii* must often become f. *dilutior* late in the season. In the sheet you sent me both terminal spikes are staminate at the base as well as at the apex, the perigynia being restricted to the central portion. However, I doubt that sexual aberration in the terminal spike of this species is anymore deserving of recognition than scale-color. I have f. *heterostachya* and the typical form on the same plant in a collection from northern Michigan."

CAREX DEBILIS Michx. (typical). The typical form of this species has not been reported previously from Missouri. It is known from the following collection: depressions in swamp dominated by *Lindera melissae-folium*, surrounded by sandy, wooded and cultivated knolls, T22N, R4E, SE part of sect. 35, 4¾ miles south of Naylor, Ripley Co., May 28, 1951, *Steyermark 71228*. In this collection the perigynia are 8–8.5 mm. long, but the pistillate scales are greenish-white.

CAREX DIGITALIS Willd. var. *MACROPODA* Fern. This variety, previously unknown from Missouri, is represented by the following collections: north-facing slopes along Crooked Creek, T31N, R9E, sect. 16, 2–3 mi. southeast of Bessville, Bollinger Co., May 17, 1950, *Steyermark 69613a*; rich, north-facing ravine along tributary of Drv Fork of Charrette Creek, T46N, R2W, sect. 19, 4 mi. northwest of Hopewell, 7 mi. southwest of Warrenton, Warren Co., June 8, 1952, *Steyermark 73327*.

CAREX STRICTA Lam. var. *STRICTIOR* (Dewey) Carey. Dr. F. J. Hermann has kindly verified the junior author's determination of this species, neither the typical form of the species nor any of its varieties having been previously identified correctly from the state. The following collections are given: swampy meadow along Bee Fork, T32N, R2W, sect. 23, 4½ mi. southeast of Bunker, Reynolds Co., May 29, 1951, *Steyermark 71303*; swampy meadow along Bee Fork, on property of Joe Goforth, T32N,

R2W, sect. 23, $4\frac{1}{2}$ – $4\frac{3}{4}$ mi. east of Bunker, July 7, 1951, *Steyermark 72032*, "in dense colonies; leaves dark green; perigynia appressed."

POPULUS NIGRA L. var. *ITALICA* Muenchh. Several small specimens escaped from cultivation and spreading form the basis for the following collection: open ground, border of woods, 4 mi. northwest of Webb City, Jasper Co., Sept. 27, 1952, *Palmer 55194*.

ULMUS PUMILA L. This species, now becoming common in cultivation, seems to be well established in the rocky valley of Hickory Creek, in Newton County, where a number of specimens of different sizes were seen. At the McDonald County station only one tree was seen. Rocky waste ground along Hickory Creek, Neosho, Newton Co., Oct. 19, 1953, *Palmer 57208*; same locality, Nov. 3, 1953; same locality (in bloom), March 6, 1954, *Palmer 57218*; near Beaver Brook Spring, Anderson, McDonald Co., Oct. 19, 1954, *Palmer 59240*.

PILEA PUMILA (L.) Gray. (typical). The typical form of this species is based upon the following collection: along Bookout Branch and ravines tributary to Spring Creek, T64N, R18W, SW $\frac{1}{4}$ sect. 21 and NE $\frac{1}{2}$ sect. 28, $4\frac{1}{2}$ mi. northeast of Green City, Sullivan Co., August 25, 1950, *Steyermark 70149*.

CERASTIUM VISCOSUM L. forma *APETALUM* (Dumort.) Mert. & Koch. This form, not previously reported from the state, is represented by the following collection: open grassy ground on top of ridge in sect. 24, cherty limestone upper slopes above northwest-facing wooded bluffs along Flat Creek, T45N, R21W, $2\frac{1}{2}$ mi. south of Sedalia, Pettis Co., May 20, 1949, *Steyermark 67973*.

NYMPHAEA ODORATA Ait. forma *ROSEA* Guillon. This form of the water-lily, in which the petals are roseate, was found well established in an artificial lake in northern Missouri. It has not been previously reported from the state. According to Mr. Raymond Buster of Ethel, Missouri, the plants were purchased from Vaughan's Seed Store in Chicago and planted in the lake ten to fifteen years ago. These plants are established, growing in a colony in which the flowers open in the morning and close about 2 p.m. The petals, on several flowers examined, number about 28 and vary from obtuse to rounded at the apex; there are 4 sepals present. The flowers are fragrant, the petioles are coiled at the base, and the leaves are all floating and purple beneath. The data for this collection are as follows: near shore of Ethel Lake, T59N, R17W, S part of sect. 25 and N part of sect. 36, $\frac{3}{4}$ mi. west of Ethel, Macon Co., Sept. 14, 1954, *Steyermark 77311*.

DRABA VERNA L. var. *BOERHAAVII* Van Hall. This variety, not previously reported from the state, is based upon the following collection: grassy, rocky, open places along road bordering limestone wooded banks along creek along highway 21 and 49, just northeast of Centerville, Reynolds Co., March 30, 1949, *Steyermark 67107*.

SEDUM SARMENTOSUM Bunge. This is an evident escape from cultivation and it may have been originally planted in the vicinity, but is now well established and locally abundant in a wild spot near one of the spring

heads. The data for the collections cited are: on moist mossy rocks, Haddock Spring, Newton Co., Nov. 3, 1953, *Palmer 57195*; same locality, May 19, 1954, *Palmer 57624*.

SPIRAEA PRUNIFOLIA Sieb. and Zucc. This species, not recorded in the 8th edition of Gray's Manual, has become thoroughly established in at least two places in Missouri, and is based upon the following collections: escaped from old cemetery in woods on ridge top and established as a shrub forming thickets on north-facing, steep, wooded bluffs with limestone at top along Missouri River, T44N, R10W, sect. 16, just north and northwest of Osage City, Cole Co., May 20, 1950, *Steysmark 69747*; planted at edge of cemetery, but escaping and thoroughly established along fence row, above ravines bordering Wyaconda River, T62N, R6W, sect. 18, 7 mi. northwest of Canton, Lewis Co., July 27, 1952, *Steysmark 74161*.

PYRUS MELANOCARPA (Michx.) Willd. This remarkable addition to the state flora of an essentially boreal and northerly distributed species was discovered, not in the northern section of Missouri, where it might have been expected, but in the southeastern corner of the state ordinarily occupied by species of an essentially Mississippi Embayment-Gulf and Atlantic Coastal Plain distribution. The data for the collection are as follows: in midst of dense alder thickets along spring branch east and southeast of Pleasant Valley Church, east of spring-fed creek, along flood plain and Crowley Ridge junction, on property of E. Walker, T25N, R11E, sect. 6, $3\frac{1}{2}$ mi. southeast of Bloomfield, Stoddard Co., August 20, 1954, *Steysmark 76825*, "plants 3 feet tall."

RUBUS ALLEGHENIENSIS Porter var. *PLAUSUS* Bailey. Not previously reported for Missouri, this variety is based upon the following collection: in open ground of valley between ravines tributary to wooded slopes along north side of North River, "Miller's Hills," T59N, R9W, west part of sect. 2, $2\frac{1}{2}$ mi. southeast of Burksville, Shelby Co., June 5, 1951, *Steysmark 71705*.

ROSA MICRANTHA Sm. This species has not been recorded previously from the state. It is based upon the following collection: fallow pasture above wooded slopes following ravine along tributary to Salt River, T60N, R13W, NE $\frac{1}{4}$ sect. 1 and sect. 36, $1\frac{1}{2}$ mi. northwest of Locust Hill, Knox Co., Sept. 18, 1950, *Steysmark 70672*.

GERANIUM DISSECTUM L. This and the following record of *Geranium molle* were originally brought to the attention of the junior author by Mr. Oscar Petersen, poet-naturalist and amateur botanist of St. Louis Co. Both species are of spontaneous occurrence and have become well established on his property since 1951. The data for this collection are as follows: on property of Mr. Oscar Petersen, 267 Elm Ave., Glendale, St. Louis Co., June 7, 1952, *Steysmark 73314*.

GERANIUM MOLLE L. Collected on property of Mr. Oscar Petersen, 267 Elm Ave., Glendale, St. Louis Co., June 7, 1952, *Steysmark 73315*.

EUPHORBIA GEYERI Engelm. This species, not previously known from a definite Missouri collection, was found near the Iowa line and is based upon the following data: natural sandy prairie on slopes of old river ter-

race on beach paralleling Des Moines River, T65N, R6W, sect. 9, $1\frac{1}{2}$ mi. southeast of St. Francisville, Clark Co., August 13, 1949, *Steyermark 68876*, "plant prostrate; leaves pale beneath."

ACER RUBRUM L. forma *TOMENTOSUM* (Desf.) Dansereau. This form, not previously reported from Missouri, is based upon the following collection: cherty upper slopes of ravine tributary to Little Niangua River, T38N, R18W, sect. 4, $4\frac{1}{2}$ mi. southeast of Barnumtown, Camden Co., July 6, 1952, *Steyermark 73743*.

JUSSIAEA URUGUAYENSIS Camb. This South American plant has become quite abundant and grows in large colonies for some distance along the creek in association with several other introduced plants, including *Phalaris arundinacea* L., *Vicia Cracca* L., *Myriophyllum brasiliense* Camb., and *Myosotis scorpioides* L. The garden Forget-me-not is also very abundant along rocky margins for some distance up and down the creek. It had previously been recorded from the vicinity of St. Louis. The data for the *Jussiaea* collection are as follows: in shallow running water of Hickory Creek, Neosho, Newton Co., Oct. 12, 1953, *Palmer 57068*.

GAYLUSSACIA BACCATA (Wang.) K. Koch. Another remarkable discovery, this species can now be definitely added to the known flora of the state, where it was found in an unglaciated section of east-central Missouri north of the Missouri River, where *Trillium nivale* also occurs. It was growing with *Vaccinium vacillans* and was almost mistaken in the field for that species. The data for the collection are as follows: cherty upper slopes above north-facing limestone bluffs along West Fork of Cuivre River, T50N, R3W, sect. 32, $8\frac{1}{2}$ mi. northeast of Bellflower, Montgomery Co., Sept. 16, 1954, *Steyermark 77419*.

DODECATHEON MEADIA L. var. *BRACHYCARPUM* (Small) Fassett forma *PALLIDUM* Fassett. This form of the variety, without red at the base of the leaves, is based upon the following collection: north- and northeast-facing, limestone, wooded, small bluffs along Camp Ground Creek, T40N, R11W, sect. 6, 6 mi. northwest of Tavern, Maries Co., May 19, 1950, *Steyermark 69701*.

BARTONIA PANICULATA (Michx.) Muhl. (typical). This surprising discovery was made at the head of a sandy spring branch where *Ilex opaca* and *Fraxinus tomentosa* occurred at the base of Crowley Ridge in the southeastern section of Missouri, noted for its prominence of species following a Mississippi Embayment-Atlantic and Gulf Coastal Plain distributional pattern. The locality was not far from the alder thickets where *Pyrus melanocarpa* (reported above) was discovered on the same day. In the Missouri collection the corolla lobes are creamy-white above, 1 mm. wide, the anthers are yellow, and the filaments white below and lavender above. The data for this collection are as follows: on mossy ground at head of sandy spring branch, at base of sandy ravine near junction of Crowley Ridge and lowland, T25N, R11E, NW $\frac{1}{4}$ sect. 6, $3\frac{1}{2}$ mi. southeast of Bloomfield, on property of Mr. Martin, Stoddard Co., August 20, 1954, *Steyermark 76784*.

CONVOLVULUS SEPIUM L. var. *REPENS* (L.) Gray. Although Missouri

is in the general range stated in the 8th edition of Gray's Manual for this variety, it has not been recorded previously for the state. The record for its occurrence is based upon the following collection: swales in bottoms of Missouri River valley, T59N, R38W, SW sect. 14 and N part of sect. 23, 4-4½ mi. south of Oregon, Holt Co., July 20, 1952, *Steysmark 73846*.

PHLOX DIVARICATA L. var. *LAPHAMII* Wood, forma **candida** Palmer & Steysmark, f. nov. A typo differt floribus albis.—Low, rich, alluvial woods, 1 mile west of Nashville, Barton County, Missouri, April 30, 1953, *Ernest J. Palmer 55411*, HOLOTYPE, in Palmer Herb., isotype in Herb. Chi. Nat. Hist. Mus.; terrace along alluvial bottoms of Grand River along route 36, 4 mi. southwest of Chillicothe, Livingston Co., May 1, 1950, *Julian A. Steysmark 69584*, PARATYPE, in Herb. Chi. Nat. Hist. Mus.

It is necessary to give a name to the white-flowered form of *Phlox divaricata* var. *Laphamii*. Dr. Wherry lists this white-flowered form in *Bartonia* 12: 34. 1930, but as stated by him in a recent communication with the present authors, his reference to the albino form, without a diagnosis or type specimen indicated, is not validly published.

LITHOSPERMUM CANESCENS (Michx.) Lehm. forma **pallidum** Palmer & Steysmark, f. nov. A typo recedit corollis pallido-luteis.—Along southeast side of highway 54, ½ mi. southwest of junction with highway 154, T53N, R4W, W part of sect. 25, 4 mi. WSW of Curryville, Pike Co., Missouri, April 30, 1952, *Julian A. Steysmark 73223*, HOLOTYPE, in Herb. Chi. Nat. Hist. Mus., isotype in Mo. Bot. Gard. Herb.

This form of the common *Lithospermum canescens* has cream-colored to pale yellow, instead of orange flowers. About a dozen plants were found growing scattered among the orange-flowered ones. Individual plants transplanted to the garden of the junior author have maintained the pale color of the corolla.

LITHOSPERMUM CAROLINIENSE (Walt.) MacMill. I. M. Johnston (Journ. Arn. Arb. 33: 339-340. 1952) combines *L. croceum* Fernald with *L. caroliniense*, noting that (p. 340) "the floral differences used by Fernald to distinguish *L. croceum* from *L. caroliniense* are those which distinguish the short- and long-styled flowers of the species." We are in agreement with Dr. Johnston in combining the two species, as the differences between the two taxa, as given in the 8th edition of Gray's Manual, intergrade. If, however, *L. caroliniense* is maintained as distinct, the following Missouri collection should be cited: sandy open banks of formerly original sandy prairie, along west side of road, T25N, R14E, sect. 10, 6½ mi. southeast of Sikeston, New Madrid Co., May 18, 1950, *Steysmark 69674*.

VERBENA CANADENSIS (L.) Britt. forma **candidissima** (Haage & Schmidt) Palmer & Steysmark, comb. nov. *V. canadensis* var. *candidissima*, in Royal Hort. Soc. Diet. Gardening 4: 2210. 1951.

The white-flowered form of this species has not been recorded previously from Missouri. It is based upon the following collection: exposed limestone bluff along road, along Long Creek, just north of Oasis, T22N, R22 W, sect. 10, 11, and 3, Taney Co., April 28, 1949, *Cora Steysmark s.n.* In this collection the corolla lobes are whitish and the corolla tube is whitish with pale lilac suffused throughout.

VERONICA DIDYMA Ten. This species has not been reported previously from Missouri. It is based upon the following collection: near gas station one mile north of Kohler City, Jefferson Co., April 20, 1952, *H. E. Ahles* 5848.

GALIUM TRIFLORUM Michx. \times *G. CIRCAEZANS* var. *HYPOMALACUM* Fern. The data for this collection are as follows: in wooded ravines tributary to Thorp Branch, T59N, R8W, NE sect. 12, $4\frac{1}{2}$ mi. southeast of Oregon, Holt Co., July 20, 1952, *Steyermark* 73804. The present collection, growing with *G. circaezans* (*Steyermark* 73804a), consists of plants having the leaves in 6's and elliptic-lanceolate as in *G. triflorum*, but with pubescent stems and the midrib of the lower leaf surface pilose as in *G. circaezans* var. *hypomalacum*. So far as known, this apparent natural hybrid has not been recorded previously in literature.

HOUSTONIA PUSILLA Schoepf forma *ALBIFLORA* Standl. The form of the species with white corollas has not been recorded previously from Missouri. The following collection is representative: open ground in valley of Ottery Creek, along highway A, northeast of Redmondville, Iron Co., April 26, 1952, *Steyermark* 73101. In this collection the plants are of a much lighter green color than in typical purple-flowered *H. pusilla* (*H. patens* Ell.). The width and length of the white corollas vary considerably within a given colony of the plants. Other Missouri collections which may be referred to this form are *Steyermark* 4599 from Pulaski Co. and 4592 from Phelps Co. Although the corollas in these last two collections vary from white to white with pale blue or lilac, they are generally white throughout.

SPECULARIA LAMPROSPERMA (McVaugh) Fern. \times *S. LEPTOCARPA* (Nutt.) Gray. In a colony of the two species named above, with *S. lamprosperma* predominating, were found a few plants with characters quite intermediate between the two and of evident hybrid origin. The data for this collection are: chert glades along Shoal Creek, $\frac{1}{4}$ mi. southwest of Joplin, Newton Co., May 29, 1952, *Palmer* 54078.

LOBELIA CARDINALIS L. forma *ROSEA* St. John. Not previously recorded from Missouri, this form of the cardinal flower was collected in a wet, calcareous meadow along Parker Branch of West Fork of Black River, T33N, R3W, west part of sect. 15, $\frac{1}{4}$ mi. northwest of Marcocot, 5 mi. northwest of Greeley, Reynolds Co., Sept. 24, 1951, *Steyermark* 72729. In this collection the corolla tube is pink to rose-colored, the corolla lobes are pink on the outside, white on the inside, and the staminal tube is white.

ASTER AZUREUS Lindl. forma *LAEVICAULIS* Fern. The following collection may be referred to this form, not previously reported from the state: upland roadside banks, T59N, R31W, sect. 4, $3\frac{1}{4}$ mi. southwest of Fairport, Dekalb Co., Sept. 27, 1951, *Steyermark* 72869. This collection represents an unusually floriferous specimen, which may actually be a hybrid between *A. laevis* and *A. azureus*, with both of which species the plants were growing. The upper surface of the leaves in this collection are scabrous as in *A. azureus* and the stems are glabrous as in *A. laevis*.

ASTER CORDIFOLIUS L. var. *MORATUS* Shinnars. Not previously re-

ported for the state, this variety is based upon the following collection: along base of La Motte sandstone bluffs along Terre Bleue Creek, T37N, R6E, south part of sect. 20 and north part of sect. 29, 2-2½ mi. south of Thurman, 5-6 mi. northwest of Sprott, Ste. Genevieve Co., October 3, 1950, *Stejermark* 71041.

ASTER CORDIFOLIUS L. var. *POLYCEPHALUS* Porter. In the 8th edition of Gray's Manual, the range for this variety is given as "SW. Que. to Ind., s. to N.E. and Ga." In addition to a specimen from Boone County previously recorded in our catalogue, it may be credited to Missouri on the basis of the following collection: limestone glade along highway 131, on south side of South Fork of Blackwater River, T46N, R28W, NW ¼ sect. 26, 3 mi. north of Holden, Johnson Co., Sept. 25, 1951, *Stejermark* 72751.

ASTER DUMOSUS L. var. *STRICTIOR* T. & G. Not previously reported from Missouri, this variety may be added to the state flora on the basis of the following collection: meadow along north side of highway 80, 4.9 mi. southwest of West Plains, Howell Co., Sept. 25, 1949, *Stejermark* 69336.

ASTER OBLONGIFOLIUS Nutt. forma *ROSEOLIGULATUS* (Benke) Shinnars. This form has not been recorded previously from the state. It is based upon the following collection: edge of limestone escarpment of SE-facing Chapel Bluff along Niangua River, T37N, R18W, sect. 26, 8-8½ mi. southeast of Macks Creek, Camden Co., October 24, 1954, *Stejermark* 78223. The rays in this collection varied from pink to rose-colored.

ASTER VIMINEUS Lam. (typical). Although the var. *subdumosus* Wieg. is known from Missouri, the typical variety of the species has not previously been reported from the state. It is based upon the following collection: alluvial lower part of north-facing limestone slopes along Salt River, Mark Twain State Park, T54N, R8W, sect. 9 and 16, 1-2 mi. southwest of Florida, Monroe Co., Sept. 25, 1948, *Stejermark* 66529. In this collection the ray florets vary from 16 to 20 in number, the lobes of the corollas of the disk florets are erect, about 2/5 the length of the throat, and are 0.9-1 mm. long.

HELIANTHUS ANNUUS L. var. *NANUS* fl. pl. Hort. This double-flowered variety with the stems averaging about 3 feet high is locally common in Holt Co., northwestern Missouri. It has not been previously reported for the state. The collection upon which it is based is as follows: common escape throughout this area in low ground in extensive swale, T62N, R40W, sect. 25, 3¾ mi. southeast of Craig, Holt Co., July 20, 1952, *Stejermark* 73788. The robust-stemmed (averaging 6 feet tall), double-flowered variety is referred to var. *chrysanthemoides* Cockerell (Am. Nat. 49: 617. 1915), but the present collection is better referred to the dwarf type.

LIATRIS SCABRA (Greene) K. Schum. This species has not been previously reported from the state. It is based upon the following collection: ravine slopes tributary to river, along Little Black River, between Greenville Ford and Pennington Ford, T24N, R3E, sect. 10, 15, 22, 23, 26, 24, and 25, 10-13 mi. northeast of Doniphan, Ripley Co., Sept. 1, 1946, *Stejermark* 63966.

CICHORIUM INTYBUS L, forma *ALBUM* Neum. This form with the flowers entirely white has not been recorded previously from Missouri. It is based upon the following collection: along route 129, 2.3 mi. south of Green City, Sullivan Co., August 25, 1950, *Steyermark 70127*.—WEBB CITY, MISSOURI, CHICAGO NATURAL HISTORY MUSEUM.

CONTRIBUTIONS TO THE FLORA OF SOUTHERN ILLINOIS.—Field work in southern Illinois the latter part of 1954 produced several species of plants new to Illinois. In addition, the ranges of other uncommon species have been extended by further collections.

Areas of particular interest occur in Randolph County; here are found such rare species for Illinois as *Pinus echinata*, *Asplenium bradleyi*, *Ranunculus harveyi*, *Talinum calycinum*, *Rhamnus caroliniana*, *Carex torta*, *Carex aquatilis* var. *altior*, and *Solidago buckleyi*.

Herbaria and their abbreviations for specimens cited in this paper are as follows: Southern Illinois University (SIU), University of Illinois (UI), Illinois State Museum (ISM), Illinois Natural History Survey (NHS), and that of the author (A).

SPECIES NEW TO ILLINOIS

CAREX DEBILIS Michx. The habitat in Illinois for this species is near the base of a densely shaded east-facing hillside. Its common associates at this station are *Spigelia marilandica* and *Pedicularis canadensis*. The species occurs in south-central and south-eastern Indiana, the nearest stations to ours being in Lawrence and Crawford Counties.¹ COLLECTION DATA: rich woods near Cave-in-Rock State Park, Hardin County, June 20, 1954, *Mohlenbrock 4257* (A).

CAREX SWANII (Fern.) Mackenz. The only report of this species from Illinois is based on a questionable specimen from Vermilion County, although it is not uncommon in western Indiana. It apparently is unknown from Missouri. Two plants at our station are growing at the base of a sweet gum (*Liquidambar styraciflua*). COLLECTION DATA: dry soil at the edge of a marsh, one mile north of Murphysboro, Jackson County, June 5, 1954, *Mohlenbrock 3327*. (A).

TALINUM CALYCIUM Engelm. Although this species is known from eastern Missouri, it appears that the present collection represents the first from Illinois.² A single plant was found growing along the edge of a sandstone bluff in Randolph County on August 15, 1954. A search for additional plants of this species a week later in the same area proved

¹ DEAM, CHARLES C. *Flora of Indiana*. 1940.

² Personal correspondence with Mr. Harry E. Ahles, University of Illinois Herbarium.

successful as some one hundred specimens were seen, many in full flower. They were associated with *Isanthus brachiatus*, *Opuntia humifusa*, and *Polygonum tenue*. This station in southwestern Illinois extends the range of the species to the east. COLLECTION DATA: thin soil on a dry sandstone bluff, "Castle Rock", near Leanderville, Randolph County, August 15, 1954, *Mohlenbrock 4550* (SIU, A).

RANUNCULUS PARVIFLORUS L. This species, naturalized from Europe, is uncommon in the midwest. It is unreported from Indiana and is known in Missouri only from Butler and Dunklin Counties.³ It grows in an open wet place in a mesic woods. COLLECTION DATA: low woods, Saltpeter Cave, five miles south of Murphysboro, Jackson County, *Mohlenbrock 1936*.

PTILIMNIUM COSTATUM (Ell.) Raf. It had been thought that two species of *Ptilimnium* occurred in Illinois—*P. nuttallii* (DC.) Britt. and *P. capillaceum* (Michx.) Raf.⁴ However, when the author was asked to collect specimens of these two species, the first *Ptilimnium* collected keyed out to *P. costatum*. Upon checking the herbarium specimens of *Ptilimnium* at Southern Illinois University, University of Illinois, Illinois State Museum, and the Illinois Natural History Survey (the last three by Mr. Harry Ahles), it was discovered that all sheets labelled *P. capillaceum* were actually either *P. costatum* or *P. nuttallii*. In addition, some *P. costatum* specimens had been identified as *Carum carvi*. Further field work led only to the discovery of more *P. costatum*. So far, no authentic specimens of *P. capillaceum* have been located for Illinois. SPECIMENS EXAMINED: Union County: wet soil, Big Muddy River bottoms, July 29, 1941, *G. D. Fuller* and *R. Fisher 746* (UI, NHS, ISM); river bottom forest, Clear Creek, Sept. 12, 1940, *Fuller 289*. Jackson County: rich woods northeast of Howardton, Sept. 13, 1941, *McCree 1197* (SIU, UI); Campbell Lake area near Elkhville, July 17, 1941, *McCree 929* (SIU, UI); wet soil, Carbondale, Sept. 13, 1941, *G. D. Fuller* and *W. B. Welch 1197* (ISM); six miles east of Elkhville, low woods, *Mohlenbrock 1912* (A). Pulaski County: without definite locality or date, *Fricke*.

PTILIMNIUM NUTTALLII (DC.) Britt. Randolph County: roadside in low ground, two miles northwest of Sparta, July 13, 1950, *G. S. Winterringer 4848* (ISM). Jackson County: north of Makanda, August 2, 1950, *Bailey and Swayne 1114* (SIU).

RUPELLIA CAROLINIENSIS (Walt.) Steud. The discovery of this species in Illinois is not too surprising since it is found rather frequently in southern Indiana and Missouri. Its associates at our station include *Scutellaria ovata* and *Monarda fistulosa*. COLLECTION DATA: edge of woods, near Cave-in-Rock State Park, Hardin County, June 20, 1954, *Mohlenbrock 4286* (A).

VERONICA POLITA Fries. (*Veronica didyma* Tenore of Pennell⁵). This

³ PALMER, E. J. AND J. A. STEYERMARK. An Annotated Catalogue of the Flowering Plants of Missouri. Ann. Mo. Bot. Gard. Vol. 22. 1935.

⁴ JONES, G. N. Flora of Illinois. 1950.

⁵ PENNELL, FRANCIS W. The Scrophulariaceae of Eastern Temperate North America. 1935.

species is adventive from Eurasia. In southern Illinois, it has been found on a semi-weedy lawn, growing with *Veronica arvensis* but flowering much earlier. COLLECTION DATA: lawn, Murphysboro, Jackson County, March 10, 1955, *Mohlenbrock 4984* (A).

ADDITIONAL DISTRIBUTION RECORDS OF SOME ILLINOIS PLANTS

LOPHOTOCARPUS CALYGINUS (Engelm.) J. G. Sm. forma *MAXIMUS* (Engelm.) Fern. The giant form of this species was found growing in a drainage ditch in the southwestern part of Murphysboro. The width of the leaves slightly surpassed three decimeters. The "typical" form is present in Lake Murphysboro. In addition to Jackson County, the species is known in Illinois from Pope, Piatt, Mason, Fulton, Peoria, and Henderson Counties. Only Pope and Jackson are in the southern part of the state. COLLECTION DATA: drainage ditch, Murphysboro, Jackson County, August 14, 1954, *Mohlenbrock 4735* (A).

PANICUM LANUGINOSUM Ell. var. *IMPLICATUM* (Scribn.) Fern. This taxon, found in dry soil at the edge of a woods in Jackson County, is generally more widespread to the north in Illinois. COLLECTION DATA: Giant City State Park, Jackson County, June 19, 1954, *Mohlenbrock 3206* (A).

HEMICARPHA MICRANTHA (Vahl) Pax. Previous to its discovery in Jackson County, this tiny sedge was known in Illinois only from the northern and central counties (the most southern record being from Piatt County). This species was found at two stations along the Mississippi. COLLECTION DATA: in sand, Mississippi River cutoff, one mile south of Grand Tower, Jackson County, August 20, 1954, *Mohlenbrock 4640* (UI, A); near Cora, Jackson County, August 24, 1954, *Mohlenbrock 4648* (UI, A).

CAREX BRACHYGLOSSA Mackenz.. The Jackson County collection extends the range of this primarily northern Illinois species to the south. COLLECTION DATA: edge of Walker Hill Pond, Grand Tower, Jackson County, July 15, 1954, *Mohlenbrock 4753* (A).

CAREX SPARGANIOIDES Muhl. The habitat for this species is rich mesic woodlands. The Jackson County locality is about 175 miles south of the nearest station in Illinois for this species (Menard County). COLLECTION DATA: rich, moist woods, Lake Murphysboro area, Jackson County, June 12, 1954, *Mohlenbrock 2679* (A).

ALLIUM STELLATUM Fraser. This is one of the species characteristic of the hilltop prairies found along the southwestern border of the state. These prairies, atop limestone bluffs, are minute replicas of the prairies to the west. Other species which grow in this type of community include *Bouteloua curtipendula*, *Andropogon scoparius*, *Andropogon gerardi*, *Petalostemum purpureum*, *Petalostemum candidum*, and *Kuhnia eupatorioides*. The *Allium* is known in Illinois only from Jackson, McHenry and Union Counties. COLLECTION DATA: hilltop prairie north of the Pine Hills, Jackson County, August 6, 1954, *Mohlenbrock 4760* (UI, A).

HEXALECTRIS SPICATA (Walt.) Barnh. A colony of seventeen plants

of this rare orchid was discovered growing on an east-facing slope in an oak-hickory woods in Jackson County. Only two other locations are known for this species in Illinois (Randolph and Pope Counties). COLLECTION DATA: dry wooded slope, Fountain Bluff, Jackson County, July 20, 1954, *Sanders, Voigt, and Mohlenbrock 4330* (SIU).

RUMEX MARITIMUS L. var. *FUEGINUS* (Phil.) Dusen. This species, like *Hemicarpha micrantha*, was found growing in sand one mile south of Grand Tower. It now is known in Illinois from McHenry, Tazewell, Whiteside, and Jackson Counties. COLLECTION DATA: in sand, Mississippi River cutoff, one mile south of Grand Tower, Jackson County, August 20, 1954, *Mohlenbrock 4641* (A).

POTENTILLA PARADOXA Nutt. Specimens of this plant were found growing in sand along the Mississippi River in close association with *Hemicarpha micrantha* and *Rumex maritimus* var. *fueginus*. In addition to Jackson County, it is known in Illinois from Randolph and St. Clair Counties. COLLECTION DATA: Mississippi River cutoff, one mile south of Grand Tower, Jackson County, August 20, 1954, *Mohlenbrock 4637* (UI, A).

GEUM VIRGINIANUM L. Since this species was first reported from Illinois in 1954,⁶ it has been found in three additional counties. The habitat at each station is in an open oak-hickory woods. COLLECTION DATA: Pounds Hollow, Gallatin County, summer, 1954, *Mohlenbrock, Voigt, and Sanders 1921* (SIU); Panther's Den, Williamson County, summer, 1954, *Mohlenbrock, Voigt, and Sanders 1976* (SIU); Jackson Hollow, Pope County, July 15, 1954, *Mohlenbrock 4311* (A).

CORNUS ALTERNIFOLIA L. f. This dogwood is not too uncommon in northern Illinois, but the Pope County collection is the first reported from southern Illinois. It grows in abundance in a rich beech-maple forest at Belle Smith Springs. COLLECTION DATA: rich woods, Belle Smith Springs, Pope County, June 23, 1954, *Mohlenbrock 3889* (A).

ONOSMODIUM HISPIDISSIMUM Mackenz. This species is not common in southern Illinois, the present collection being the first from Jackson County. It grows on an outcrop of limestone along the Mississippi River. COLLECTION DATA: atop a limestone bluff, Devil's Bake Oven, near Grand Tower, Jackson County, June 27, 1954, *Mohlenbrock 3206* (A).

LIATRIS CYLINDRACEA Michx. This is another of the hilltop prairie species of southwestern Illinois. The Jackson County station is the only extreme southern Illinois record. COLLECTION DATA: hilltop prairie north of the Pine Hills, Jackson County, Sept. 9, 1954, *Mohlenbrock 4758* (A, UI).

The author wishes to thank Mr. Harry E. Ahles of the University of Illinois Herbarium who supplied the distributional records for each species in Illinois.—ROBERT H. MOHLENBROCK, DEPARTMENT OF BOTANY, WASHINGTON UNIVERSITY, ST. LOUIS, MISSOURI.

⁶ MOHLENBROCK, R. H. RHODORA 56: 227-228. 1954.

AN ADDITIONAL SPECIES OF THE LICHEN GENUS
BUELLIA FROM THE WEST INDIESHENRY A. IMSHAUG¹

THE present author has recently (Imshaug 1955) published a revision of the West Indian species of *Buellia*. Since then he has studied the West Indian species of the closely related genus *Rinodina*. Only three saxicolous species of *Rinodina* have been reported from the West Indies and all three were described by Wainio from material collected in the Virgin Islands by F. Børgesen in 1906; *R. antillarum* from St. Thomas, *R. boergesenii* from St. Croix and *R. pyxinoides* from St. John. Each species was collected from only one locality, each on a different island. I have been able to examine these collections through the courtesy of Dr. M. Skytte Christiansen to whom I would like to express my sincere appreciation.

All three collections represent the same species which is identical with *Buellia microphylla* Malme. Wainio's three names, however, antedate *B. microphylla*. Of the three names only the specific epithet *pyxinoides* has not previously been used in *Buellia*.

A description of the West Indian material follows:

Buellia pyxinoides (Wain.) Imshaug, comb. nov., based on *Rinodina pyxinoides* Wain. Ann. Acad. Sci. Fenn. A. 6(7): 75. 1915. *Rinodina boergesenii* Wain. Ann. Acad. Sci. Fenn. A. 6(7): 76. 1915. *Rinodina antillarum* Wain. Ann. Acad. Sci. Fenn. A. 6(7): 77. 1915. *Buellia microphylla* Malme, Ark. Bot. 21A(14): 40. 1927.

TYPE COLLECTIONS: *R. pyxinoides*—Collected on non-calcareous rocks at Cruzbay, St. John (West Indies) by F. Børgesen on March 13, 1906. Holotype in C. *R. boergesenii*—Collected on non-calcareous rock at Hams Bluff, St. Croix (West Indies) by F. Børgesen on Feb. 6, 1906. Holotype in C. *R. antillarum*—Collected on non-calcareous rock at Magsenbay Estate, 800 ft. elev., St. Thomas (West Indies) by F. Børgesen on Dec. 28, 1906. Holotype in C. *B. microphylla*—Collected "in rupe praerupta subumbrosa" in Paraguay (Paraguari, Santo Tomas) by G. O. Malme, no. 1508 B. Isotype seen in MO.

HYPOTHALLUS composed of many black patches which tend to become continuous. THALLUS initiated as small, round, flat areoles which expand to become convex and lobate or squamulose, rarely becoming contiguous or rimose-areolate; cinereous or sometimes \pm ochraceous. APOTHECIA at first immersed but soon emergent with superficial thalloid covering

¹ Department of Botany, University of Idaho, Moscow, Idaho.

which soon disappears, round or occasionally crenate, 0.3–0.7 mm. across; disks black, plane, naked; margins rather thick and concolorous.

HYPOTHECIUM \pm colorless; exciple \pm colorless inside but with thick, dark brown margin. HYMENIUM 70–75 μ thick, colorless, not interspersed with oil drops; paraphyses enlarged at apices and fusco-capitate, forming a light brown epithecium. Spores 8 in ascus, mischoblastiomorph, fumose, (14) 15–21 (24) \times (7) 8–11 (12) μ . CHEMICAL REACTIONS: Thallus section KOH—; apothecial tissues KOH—.

MATERIAL SEEN: ST. CROIX—Hams Bluff, Børgesen, 1906 (C). ST. THOMAS—Magensbay Estate, 800 ft. elev., Børgesen, 1906 (C). ST. JOHN—on maritime rocks, Cruzbay, Børgesen, 1906 (C).

Wainio recognized the similarity between *Rinodina pyxinoides* and *R. boergesenii*. The latter species was separated only by apothecia with thinner margins and non-mamillate disks. These were the same characters Wainio used to separate *Buellia gyrosa* Wain. (Syn. *B. trachyspora*) from *B. trachyspora* Wain. Wainio did not compare *Rinodina antillarum* with *R. pyxinoides* but the only significant difference I could find was in the spore size. Since the spore size seems rather variable and since my measurements do not agree with those given in the original descriptions they are recorded here:

	Author's measurements (in KOH)	Original description
<i>R. pyxinoides</i> (holotype)	17–24 \times 10–12 μ	16–21 \times 8–9 μ
<i>R. boergesenii</i> (holotype)	17–21 \times 9–11 μ	13–17 \times 7–9 μ
<i>R. antillarum</i> (holotype)	(14) 15–17 \times 7–8 μ	(10) 12–16 \times 5–8 μ
<i>B. microphylla</i> (isotype in MO)	18–24 \times 10–14 μ	16–21 \times 8–9 μ

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